

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

CORRECTED VERSION

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
31 July 2003 (31.07.2003)

PCT

(10) International Publication Number  
WO 03/063243 A1

(51) International Patent Classification<sup>7</sup>: H01L 23/48,  
21/44

(21) International Application Number: PCT/US03/02106

(22) International Filing Date: 24 January 2003 (24.01.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/351,644 24 January 2002 (24.01.2002) US

GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,  
SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI,  
SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN,  
GQ, GW, ML, MR, NE, SN, TD, TG).

**Declaration under Rule 4.17:**

— of inventorship (Rule 4.17(iv)) for US only

**Published:**

— with international search report  
— with amended claims

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Date of publication of the amended claims: 9 October 2003

(48) Date of publication of this corrected version:  
4 December 2003

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**(15) Information about Correction:**

see PCT Gazette No. 49/2003 of 4 December 2003, Sec-  
tion II

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(54) Title: THIN FILMS, STRUCTURES HAVING THIN FILMS, AND METHODS OF FORMING THIN FILMS

(57) Abstract: The invention described herein relates to new titanium-comprising materials which can be utilized for forming tita-  
nium alloy barrier layers for Cu applications. Titanium alloy sputtering targets can be reactively sputtered in a nitrogen-comprising  
sputtering gas atmosphere to form titanium alloy nitride film, or alternatively in a nitrogen-comprising and oxygen-comprising at-  
mosphere to form titanium alloy oxygen nitrogen thin film. The thin films formed in accordance with the present invention can  
contain a non-columnar grain structure, low electrical resistivity, high chemical stability, and barrier layer properties comparable or  
exceeding those of TaN.

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